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File Code: 3420 **Date:** June 18, 2003
Route To:

Subject: White Fir Mortality along the Crest National Scenic Byway (sandiard)

To: District Ranger, Sandia RD

On Monday May 19, 2003, Joe Price, Zone Fuels/Soils/Watershed, Sandia RD, and I looked at the white fir mortality occurring along the Crest National Scenic Byway just north of the Doc Long Group Picnic Area (Figure 1.). Joe mentioned his concern about this mortality to me when I was at the District Wednesday, May 14, 2003, giving a presentation on piñon ips beetles. I suggested we set up a site visit to determine the cause of this mortality.

Figure 1. White fir mortality occurring along the Crest National Scenic Byway just north of the Doc Long Group Picnic Area.

Our observations indicated this mortality was due to a combination of high tree densities, white fir broom rust, and drought. Tree densities were extremely high, with basal areas estimated at 150 to 250 square feet per acre. All the dead and dying white fir examined exhibited heavy bole and stem broom rust infections. These brooms are caused by the rust, *Melampsorella*

caryophyllacearum (Figures 2 and 3, below). Infections are characterized by conspicuous dense masses of branches called witches' brooms. These brooms are large and yellowish in appearance.

Figure 2. Broom rust bole and stem infections

Figure 3. Close up of fir broom rust infection.

Broom rust infections cause growth loss, top-kill, and occasionally tree mortality. The extensive mortality occurring along the Crest highway is being exacerbated by both high tree densities and the drought we have been experiencing these past few years. Trunk and stem infections provide entrance for decay fungi, often causing the tops to snap off during wind storms.

Broom rust fungi require the presence of an alternate host to complete their lifecycle and successfully spread. Chickweed is the alternate host for fir broom rust. Needles on brooms are often stunted and drop off each fall. Other fungi and organisms cause formation of witches' brooms, but only broom rust causes annual drop of needles.

There are no chemical or biological controls available for broom rust. However, for ornamental high-value trees with only a few branch infections, witches' brooms can be pruned out if the infection is not too close to the trunk.

If you have any questions concerning this site evaluation, please give me a call at (505) 842-3287 or e-mail me at trogers@fs.fed.us.

/s/ Terrence J. Rogers
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